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ABSTRACT

Within the Caribbean context, the island of Montserrat included, ability grouping has been employed as the major organizational strategy to address academic deficiencies among high school students. Although no sound philosophical basis for this type of class/group organization has been enunciated, recent research has shown that students with poor achievement may have acquired learning styles or strategies detrimental to their academic achievement. This paper describes a study using the Inventory of Learning Processes instrument to assess the learning styles of grade 9 students in two different ability groups (A and B) in the Montserrat high school system. The sample comprised 47 boys and 67 girls (aged 14) drawn randomly from the grade 9 population of Montserrat's two high schools. Results indicated that ability group A students performed better at deep processing, fact retention, and methodical study, compared with their counterparts in ability group B. The sex differences that emerged indicated female superiority over males on factors associated with methodical study. Findings point to a need for designing and implementing a program for improving students' learning process, especially those in the lower ability groups. (35 references) (MLH)

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LEARNING STYLE AND ABILITY GROUPING IN THE HIGH SCHOOL SYSTEM:

A CARIBBEAN CASE STUDY

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Summary: The study employed the Inventory of Learning Processes (Schmeck, Ribich & Ramaniah, 1977) in the measurement of the learning styles of Grade 9 students (47 boys and 67 girls) in two different ability groups A and B in the high schools of a selected Caribbean territory. Results indicated a better performance of students in ability group A in Deep Processing, Fact Retention and Methodical Study when compared with their counterparts in ability group B. The sex differences which emerged pointed to female superiority over males on behaviors reflective of Methodical Study.

Learning Style, defined by Schmeck (1988a) as the peculiar combination of strategies and processes a student habitually employs when trying to learn new material, has engaged the attention of research psychologists over the last two decades. Earlier researchers (Marton & Saljo, 1976a); Pask, 1976; Entwistle, Hanley & Hounsell 1979; Biggs, 1979) highlighted mainly qualitative differences in learning. Marton and Saljo (1976a) for example, reported that students' approaches to learning tasks could be categorized into two broad areas that they labeled as deep or surface approaches. Deep approaches involved an active search for meaning underlying principles, structures that linked different concepts or ideas together, and widely applicable techniques. Surface approaches on the other hand, relied primarily on attempts to memorize course work, treating the material as if different facts and topics were unrelated.

Follow up studies by Marton and Saljo (1976b), Svensson (1977) and Ramsden and Entwistle (1981) have demonstrated that most students were somewhat versatile in their choice of learning approach. Their choice depended on such factors as their interest in the topic, the nature of their academic motivation, the pressure of other demands on their time and energy, the total amount of content in the course, the way in which a task is introduced and their perceptions of what will be demanded of them in subsequent evaluations or applications of the material. Recent work in the field is more expansive in that issues in assessment, instruction, personality, and evaluation as they relate to learning styles and strategies are comprehensively addressed. (Weinstein, Goetz & Alexander 1988; Schmeck, 1988b; Entwistle & Warterson, 1988).

This rapidly expanding interest in learning styles has been motivated by several causes. Foremost among them is the search for effective strategies to deal with the increasingly large numbers of academically underprepared or disadvantaged students entering secondary and post secondary institutions. Many such institutions in the United States of America for example, have created special programs to remedy student deficiences (Noel & Levitz, 1982). Traditionally such programs have focused mainly on basic skills in mathematics, reading, communication, study habits and attitudes.

Within the Caribbean context, the island of Montserrat included, ability grouping has been utilized as the major organizational strategy to address academic deficiences among high school students. Ability grouping as defined by Findlay and Bryan (1975) is the method of assigning students to separate classrooms, so that children of a particular age and grade who function similarly in learning achievement and capability are placed together for instruction. It is sometimes referred to as tracking, streaming, setting, or banding although these terms may carry somewhat different meanings.

Ability grouping may assume a number of forms (Eder, 1982; Felmlee & Eder, 1983; Kulik & Kulik, 1991). In some cases the classroom of students may be heterogenous but within the class, students are sub-divided according to learning ability. In other cases, classes are made up of similar ability. But even more rigid grouping systems are obtained in some places where students with different abilities are sent to different schools. A common form of grouping used in Caribbean schools is to divide students in each grade into A and B bands. Each band is expected to master the same basics but the A's do more extensive work than the B's.

Although no sound philosophical basis for this type of class/group organization has been enunciated, research by Eylon and Reif (1984) has shown that students with poor achievement may have acquired learning styles or strategies detrimental to their academic achievement. Findings by Miller, Alway and Mc Kinley (1987) also support this view. They have noted that highly successful students use different learning strategies when compared with unsuccessful ones. Several other researchers (Dansereau, 1985; Weinstein & Mayer, 1985; Wittrock, 1985; Thomas & Rohwer 1986; Kember & Harper, 1987) have highlighted the importance of learning styles/strategies in the learning of academic material.

The successful implementation and evaluation of any learning strategies training program, however, requires a reliable and valid means for measuring students' deficits and progress. Researchers, (Schmeck, Ribich & Ramaniah, 1977;

Entwistle, 1981; Weinstein, Schulte & Cascallar, 1983) have provided measures that meet such criteria. Their inventories - Inventory of Learning Processes; Approaches to Studying Inventory; and Learning and Study Strategies Inventory respectively, were designed largely to gain insight into the varied styles and strategies employed by students in their internalization of cognitive material.

The purpose of this research therefore, is to utilize one of these measures, namely, Inventory of Learning Processes (Schmeck, Ribich & Ramaniah 1977) in the assessment of the learning styles of Grade 9 students in two different ability groups (A and B) in the Montserrat high school system. Answers will be sought to the following questions:

(1) What is the preferred learning style of Grade 9 students in the Montserrat high schools system?

(2) Are there any significant differences in learning style between Grade 9 ability groups A and B?

(3) Are there any significant differences in learning style between Grade 9 boys and girls?

METHOD

Subject

The sample comprised one hundred and fourteen 14 yr. olds. (47 boys and 67 girls) drawn randomly from the Grade 9 population of the two high schools in Montserrat.

Instrument

The Inventory of Learning Processes (Schmeck, Ribich & Ramaniah 1977) was the instrument used to assess students' learning styles. The inventory is a self reporting questionnaire of true and false statements with which students report their learning styles. The 62 items of the inventory comprise 4 different scales: Deep Processing, Elaborative Processing, Fact Retention, and Methodical Study. The Deep Processing scale has eighteen items which assess the extent to which students critically evaluate, conceptually organize, and compare and contrast information that they study. The Elaborative Processing scale consists of fourteen items which assess the extent to which students translate new information into their own terminology, generate concrete examples from their experiences, apply new information to their lives, and use visual imagery to encode new ideas. Seven items comprise the Fact Retention scale. Individuals scoring high on this scale process details and specific new information carefully regardless of what other information-processing strategies they might employ. They perform well on tests measuring names, dates, places, and other details but also tend to classify information into narrower (more precise) categories. The Methodical Study scale has twenty three items. Students who score high on this scale claim to study more often and more carefully than other students but as pointed out by Schmeck (1983), scores on the scale were negatively related to grades, critical thinking ability, verbal ability and cognitive development. Meier and Schmeck (1985) further suggest that students who score high on Methodical Study attempt to make a "good impression" by fabricating a false representation of self with regard to study habits and by avoiding the violation of social norms.

Schmeck and his colleagues reported test-retest reliability coefficients (over a two week interval) of .88 for Deep Processing; .80 for Elaborative Processing; .79 for Fact Retention and .83 for Methodical Study. Two validity studies of the inventory were also reported by Schmeck et al (1977). In the first study significant positive correlations were found between performance on a multiple choice introductory psychology test and scores on the Deep Processing scale (r=.42) and Elaborative Processing scale (r=.51). In the second study the

data showed significant relationships between memory on a word-list test and scores on Deep Processing scale (r=.50) and Elaborative Processing scale (r=.35). Reliability and validity studies of the Inventory of Learning Processes are also reported by Watkins and Hattie (1981) in their research with Australian and Filipino samples and by Kozminsky (1988) using Israeli samples.

Procedure

The Inventory of Learning Processes was administered to the sample during regular class periods. The students were given the freedom to complete the items at their own pace but were requested not to discuss their responses with their peers.

RESULTS

Means and standard deviations for the total sample and for ability groups A and B sub-samples for the Inventory of Learning Processes are presented in Table 1.

Table 1 near here

It is noted from the table that the sample of Montserratian students have reported use of the four processes measured by the Inventory of Learning Processes. Elaborative Processing and Fact Retention emerged as those utilized relatively frequently. A similar pattern with respect to the rank order of the relative frequency of use of learning processes also emerged in research involving North American samples (Schemeck & Grove 1979).

The Student's 't' statistic was applied to the mean score of the ability groups A and B to test for differences on each of the scales of the Inventory of Learning Processes. Significant differences emerged in favor of ability group A on Deep Processing (t=3.75, p<.01) Study Methods (t=2.68, p<.01) and Fact Retention (t=2.57, p<.05). There was no significant difference between the ability groups on Elaborative Processing.

Means and standard deviations were computed for boys and girls in the total sample and also for the boys and girls in ability groups A and B. Results are displayed in Table 2.

Table 2 near here

The 't' statistic was applied to the mean scores of the various sub-categories to test whether significant sex differences obtained. Results indicated significant differences on just one scale - Methodical Study in favor of the girls in each case.

Means and standard deviations were also computed for the sub-samples of boys in ability groups A and B and the sub-samples of girls in ability groups A and B. The 't' statistic was also applied to the mean scores of the same sex sub-categories to test whether significant differences obtained. Results are displayed in Table 3.

Table 3 near here

It is noted from Table 3 that both the boys and the girls in ability group A obtained significantly higher mean scores than their counterparts in group B on the Deep Processing scale. Group A boys also scored significantly higher than group B boys on Fact Retention.

DISCUSSION

Overall results of this investigation suggest critical differences in learning styles between students of different ability group levels, with those in the higher ability group A obtaining higher scores on Deep Processing, Methodical Study, and Fact Retention than their counterparts in the lower ability group B. With respect to the Deep Processing scale, the fact that ability group A achieved a significantly higher score than ability group B, is not surprising in that the scale contains items associated with good organization of information, main ideas and supporting details, and meaningful associations. These aspects of Deep Processing as pointed out by Miller, Alway and Mc. Kinley (1987) are associated with better academic performance that results when students work to integrate, understand and apply the information they are processing. The findings are also supportive of the work of Schmeck and Grove (1979), Watkins and Hattie (1981), Moss (1982) and Gadzella, Ginter and Williamson (1987).

The superiorty of the ability group A on the Methodical Study scale is an endorsement of the work of Watkins and Hattie (1981) and also that of Miller, Alway and Mc.Kinley (1987). Although the processes in the Methodical Study scale do not promote effective learning, other researchers have reported results that may help in interpreting this finding. Marton and Saljo (1976b) for example, found that multiple-choice questions encouraged rote memorization, one of the characteristics of the Methodical Study approaches. Entwistle et al (1979) and Biggs (1979) have identified similar methodical learning approaches that are characteristic of high achieving students who work in an organized manner and who would use any approach needed to achieve high grades including the use of strategies that are not associated with higher levels of thinking or reasoning.

The finding that the higher ability group A reported greater ability to retain facts than the lower ability group B is also supportive of the research work of Gadzella, Ginter and Williamson (1986). Waterston and Entwistle (1988)

have also pointed out that the Fact Retention scale actually describes a self-confident, competitive and strategic approach to studying which is likely to lead to success.

Findings which relate to sex differences on the Inventory of Learning Processes are for the most part supportive of established trends, but with one exception. Whereas researchers have reported no sex differences in learning processes (Schmeck & Ribich, 1978; Moss, 1982) differences have emerged in this study on the Methodical Study scale in favor of the girls. This consistent performance on the part of the girls both within and between the various sub-samples seemingly suggest that girls at this grade level may be more highly motivated to learn than boys and so use whatever strategies help them to succeed.

Taken as a whole, the research findings involving this Montserratian sample point to the need for the design and implementation of a program for the improvement of the learning process of students especially those in the lower ability groups. Such a program should include consideration of a student's learning approaches and learning strategies as they pertain to locating and indentifying major ideas or themes as well as organizing and integrating discrete and diverse pieces of information. This focus on deep processing should, in the final analysis, help to enhance the overall quality of the product of the Montserratian high school system.

REFERENCES

Biggs, J. B. (1979). Individual differences in the study processes and the quality of learning outcomes. Higher Education, 8, 381-394.

Dansereau, D. F. (1985). Learning strategy research. In J. Segal, S. Chipman, & R. Glaser (Eds.), Relating instruction to basic research. Hillsdale, NJ: Erlbaum.

Eder, D. (1982). Differences in communicative styles across ability groups. The board of Regents of the University of Wisconsin System, 12, 245-264.

Entwistle, N. (1981). Styles of learning and teaching. New York: John Wiley & Sons.

Entwistle, N. J., Hanley, M., & Hounsell, D.J. (1979). Identifying distinctive approaches to studying. Higher Education, 8, 365-380.

Entwistle, N., & Waterston, S. (1988). Approaches to studying and levels of processing of university students. British Journal of Educational Psychology, 258-265.

Eylon, B., & Reif, F. (1984). Effect of knowledge organization on task performance. Cognition and Instruction, 1, 5-44.

Felmlee, D., & Eder, D. (1983). Contextual effects in the classroom: the impact of ability groups on student attention. Sociology of Education, 56, 77-87.

Findlay, W. G., & Bryan, M. M. (1975). The pros and cons of ability grouping. Bloomington: Phi Delta Kappan Foundation.

Gadzella, B. M., Ginther, D. W., & Williamson, J. D. (1986). Differences in learning processes and academic achievement. Perceptual and Motor Skills, 62, 151-156.

Kember, D., & Harper, G. (1987). Implications for instruction arising from the relationship between approaches to studying and academic outcomes. Instructional Science, 16, 35-46.

Kozminsky, E. (1988). Cross-validation of the Inventory of Learning Processes: some evidence from Israeli university students. Educational and Psychological Measurement, 48, 805-814.

Kulik, J. A., & Kulik, C. C. (1991). Ability grouping and gifted students. In N. Colangelo & Davis (Eds.), Handbook of gifted education. Boston: Allyn & Bacon.

Marton, F., & Saljo, R. (1976a). On qualitative differences in learning: 1. Outcome and process. British Journal of Educational Psychology, 46, 4-11.

Marton, F., & Saljo, R. (1976b). On qualitative differences in learning: 2. Outcome as a function of the learner's conception of the task. British Journal of Educational Psychology, 46, 115-127.

Meir, S., & Schmeck, R. (1985). The burnt out college student: a descriptive profile. Journal of College Student Personnel, 63-69.

Miller, C. D., Alway, M., & Mckinley, D. L. (1987). Effects of learning styles and strategies on academic success. Journal of College Student Personnel, 399-404.

Moss, C. J. (1982). Academic achievement and individual differences in the learning processes of basic skills students in the university. Applied Psychological Measurement, 6, 291-296.

Noel, L., & Levitz, R. (Eds.) (1982). How to succeed with academically underunderprepared students. Iowa City: American College Testing Service National Center for Advanced Educational Practice.

Pask, G. (1976). Styles and strategies of learning. British Journal of Educational Psychology, 46, 128-148.

Ramsden, P., & Entwistle, N. J. (1981). Effects of academic departments on student's approaches to studying. British Journal of Educational Psychology, 51, 368-383.

Schmeck, R. R. (1988a). Individual differences in learning strategies. In C. Weinstein, E. Goetz & P. Alexander (Eds.), Learning and study strategies. San Diego: Academic Press Inc.

Schmeck, R. R. (Ed.) (1988b). Learning strategies and learning styles. New York: Plenum Press.

Schmeck, R. (1983). Learning styles of college students. In R. Dillon & R. Schmeck (Eds.), Individual differences in cognition. New York: Academic Press.

Schmeck, R., & Grove, E. (1979). Academic achievement and individual differences Applied Psychological Measurement, 43-49.

Schmeck, R., & Ribich, F. (1978). Construct validation of the Inventory of Learning Processes. Applied psychological Measurement, 2, 551-562.

Schmeck, R. R., Ribich, F., & Ramanaih, N. (1977). Development of self-report inventory for assessing individual differences in learning processes. Applied Psychological Measurement, 1, 413-431.

Svensson, L. (1977). On qualitative differences in learning: 3. Study skill and learning. British Journal of Educational Psychology, 47, 233-243.

Thomas, J. W., & Rohwer, W. D. (1986). Academic studying: the role of learning strategies. Educational Psychologist, 21, 19-41.

Watkins, D., & Hattie, J. (1981). The internal structure and predictive validity of the Inventory of Learning Processes: Some Australian and Filipino data. Educational and Psychological Measurement, 41, 511-514.

Weinstein, C. E., Geotz, E. T., & Alexander, P. A. (Eds.) (1988). Learning and study strategies. San Diego: Academic Press Inc.

Weinstein, C. E., & Mayer, R. E. (1985). The teaching of learning strategies. In M. C. Wittrock (Ed.), Handbook of research on teaching (3rd ed.). New York: Macmillan.

Weinstein, C. E., Schulte, A.C. & Cascallar, E. C. (1985). The Learning and studies Strategies Inventory (LASSI): Initial design and development, Technical Report, U S. Army Research Institute for the Social and Behavioral Sciences, Alexandria, VA.

Wittrock, M. C. (1985). Student thought process. In M. C. Wittrock (Ed.), Handbook of research on teaching (3rd ed.). New York: Macmillan.

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Table 1

Means and Standard Deviations of Scales of the Inventory of Learning Processes for the Total Sample and for Ability Groups A and B Sub-samples

Inventory of Learning Processes Scales	Total Sample (N=114)		Ability Group A (N=51)		Ability Group B (N=63)	
	M	SD	M	SD	M	SD
Deep Processing	9.89	3.56	11.22	3.80	8.83	3.02
Methodical Study	12.34	4.36	13.53	4.35	11.38	4.19
Fact Retention	4.51	1.72	4.96	1.73	4.14	1.65
Elaborative Processing	8.61	2.48	9.08	2.43	8.22	2.49

Table 2

Application of 't' statistic to means and standard deviations of scales of the Inventory of Learning Processes for sub-samples of boys and girls in the total sample and for boys and girls in Ability Groups A and B Sub-samples

Inventory of Learning Processes Scales	Total Sample				't' value	Ability Group A				't' value	Ability Group B				't' value
	Boys (N=47)		Girls (N=67)			Boys (N=16)		Girls (N=35)			Boys (N=31)		Girls (N=32)		
	M	SD	M	SD		M	SD	M	SD		M	SD	M	SD	
Deep Processing	9.47	3.36	10.19	3.67	-1.07	11.06	3.38	11.29	4.02	-0.19	8.65	3.15	9.30	2.93	-0.46
Methodical Study	10.19	4.10	13.85	3.87	-4.81**	11.69	4.74	14.37	3.94	-2.12*	9.42	3.65	13.28	3.83	-4.10**
Fact Retention	4.32	1.66	4.64	1.75	-0.98	5.13	1.59	4.89	1.81	0.45	3.90	1.60	4.38	1.70	-1.13
Elaborative Processing	8.55	2.59	8.64	2.39	-0.19	9.0	2.37	9.11	2.49	-0.15	8.32	3.75	8.13	2.24	0.31

Note: ** $p<.01$
* $p<.05$

Table 3

Application of 't' statistic to means and standard deviations of scales of the Inventory of Learning Processes for sub-samples of boys in Ability Groups A and B, and sub-samples of girls in Ability Groups A and B

Inventory of Learning Processes Scales	Boys					Girls				
	Ability Group A (N=16)		Ability Group B (N=31)		't' value	Ability Group A (N=35)		Ability Group B (N=32)		't' value
	M	SD	M	SD		M	SD	M	SD	
Deep Processing	11.06	3.38	8.64	3.15	2.43*	11.29	4.02	9.0	2.93	2.64*
Methodical Study	11.69	4.74	9.42	3.65	1.82	14.37	3.94	13.28	3.83	1.15
Fact Retention	5.13	1.59	3.90	1.60	2.49*	4.89	1.81	4.38	1.70	1.19
Elaborative Processing	9.0	2.37	8.32	2.75	0.84	9.11	2.49	8.13	2.24	1.70

Note: *<.05